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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/642,649

08/19/2003

Peter Deane

PAT 2139-2-US

3737

26123 7590 09/17/2009  
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EXAMINER

TSEGAYE, SABA

ART UNIT

PAPER NUMBER

2419

NOTIFICATION DATE

DELIVERY MODE

09/17/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipinfo@blgcanada.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/642,649	<b>Applicant(s)</b> DEANE ET AL.	
	<b>Examiner</b> SABA TSEGAYE	<b>Art Unit</b> 2419	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/29/09 has been entered.
2. Claims 1-19 are pending. Currently no claims are in condition for allowance.

### *Claim Rejections - 35 USC § 103*

3. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scott (US 6,522,642 B1) in view of Upton et al. (US 6,396,801).

Regarding claims 1-4 and 12, Scott discloses, in figs. 2 and 4, an apparatus for processing N number of input signals having a common frequency, said apparatus comprising:

at least N-1 number of serrodyne (also known **single sideband generator**) modulators (column 4, lines 12-13; 17-25) for modulating N-1 of said N number of input signals into N-1 number of modulated signals (column 3, lines 34-47);

a combiner for combining said modulated signals along with one non-modulated signal into an aggregate signal (column 4, lines 32-35);

N-1 number of demodulators for demodulating said aggregate signal, each said demodulator corresponding to one of said modulators (column 6, lines 1-6; column 13, lines 16-25); and

Art Unit: 2419

N number of duplexer filters each corresponding to one of said N number of input signals (column 4, line 65-column 15, line11);

wherein said demodulators, and said duplexer filters, are arranged so as to pass N number of demodulated portions of said aggregate signal to a corresponding output and each of said demodulated portions being substantially identical to one of said N number of input signals (column 4, line 65-column 15, line11). Scott, further, discloses that the combined signal output from the summer 151 is transmitted along the backhaul cable 152. The backhaul signal may be made suitable for transmission over a coaxial cable, fiber optic cable, or other type of transmission media using techniques known in the art (column 4, lines 33-43). In addition Scott discloses that the combined signal is split by a signal splitter 160, 183 as shown in Figs. 2 and 4. Also, as shown in Fig. 2 of Scott, the antenna signal 141 is multiplied with **a sine wave** using a mixer 150.

Scott does not disclose number of circulators in series for receiving at least part of aggregate signal and single Radio Frequency output.

Upton, in Figs. 7-9, teaches number of circulators in series (circulator 222, 228; demodulator 204, 224, 225; FIR filters 208, 212,) for receiving at least part of aggregate signal (form 220) and directs to splitter/summer 224. The splitter/summer 224 splits the signal into a number of channels. The channelized signal are directed to the various tapped delay lines 210 and **reflected back** to the splitter/summer. The reflected signals from the splitter/summer are **reflected back** to the optical circulator 222 as shown in fig. 7 (column 9, lines 48-66; column 10, lines 36-62).

Art Unit: 2419

It would have been obvious to one having ordinary skill in the art at the time the invention was made to add number of circulators in series, such as suggested by Upton, to the system of Scott in order to enable transmission of signal from one port to another and provide much better isolation so the co-channel interference decreases with circulators, thus provide more efficient and increased performance which increased data output (see Abstract and summary).

Upton, further, teaches that waveform 206 may be transmitted as either an optical or an RF waveform (column 10, lines 50-51).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute an RF output, such as that suggested by Upton, to the backhaul cable of Scott in order to route a high frequency signal between a radio transmitter and antennas.

Regarding claim 5, Scott discloses the apparatus wherein said length of cabling spans at least a portion of an antenna structure (column 9, lines 20-28).

Regarding claim 6, Scott discloses the apparatus, further including a plurality of amplifiers each located such that said input signals pass through a respective one of said plurality of amplifiers prior to passing through said at least N-1 number of modulators (column 3, lines 7-11; column 4, lines 35-40).

Regarding claims 7, 13 and 14, Scott discloses the apparatus wherein said input signals are forward link transmissions and said plurality of amplifiers are high power amplifiers (column 4, lines 35-40; column 6, lines 45-51).

Art Unit: 2419

Regarding claims 8 and 15, Scott discloses the apparatus wherein said input signals are reverse link transmissions and said pluralities of amplifiers are low power preamplifiers (column 6, lines 45-51).

Regarding claims 9 and 16, Scott discloses the apparatus wherein said input signals are forward link transmissions and said apparatus further includes a single high power amplifier for amplifying said aggregate signal, said high power amplifier located between said combiner and said length of cabling (column 6, lines 45-51).

Regarding claims 10 and 17, Scott discloses the apparatus wherein said serrodyne modulators are low loss, high power RF frequency translators (column 4, lines 5-31).

Regarding claims 11 and 18, Scott discloses the apparatus wherein said serrodyne modulators operate via a modulation scheme using multi-bit Serrodyne (column 4, lines 12-13; 17-25; column 8, lines 14-29).

Regarding claim 19, Scott discloses an apparatus for processing N number of modulated, combined, and amplified input signals having a common frequency, said apparatus comprising:

a demodulator for demodulating an amplified aggregate signal consisting of said input signals, said demodulator including (column 6, lines 1-6; column 13, lines 16-25),

N-1 number of serrodyne demodulators (column 5, lines 54-64) for demodulating said aggregate signal (column 11, lines 1-25); and

N number of duplexer filters each corresponding to one of said N number of input signals (column 4, line 65-column 15, line 11);

wherein said demodulators, and said duplexer filters are arranged so as to pass N number of demodulated portions of said aggregate signal to a corresponding output, each of said

Art Unit: 2419

demodulated portions being substantially identical to one of said N number of input signals (column 4, line 65-column 15, line 11).

Scott, further, discloses that the combined signal output from the summer 151 is transmitted along the backhaul cable 152. The backhaul signal may be made suitable for transmission over a coaxial cable, fiber optic cable, or other type of transmission media using techniques known in the art (column 4, lines 33-43). In addition Scott discloses that the combined signal is split by a signal splitter 160, 183 as shown in Figs. 2 and 4. Also, as shown in Fig. 2 of Scott, the antenna signal 141 is multiplied with **a sine wave** using a mixer 150.

Scott does not disclose number of circulators in series for receiving at least part of aggregate signal and single Radio Frequency output.

Upton, in Figs. 7-9, teaches number of circulators in series (circulator 222, 228; demodulator 204, 224, 225; FIR filters 208, 212, ) for receiving at least part of aggregate signal (from 220) (column 9, lines 48-66; column 10, lines 44-62).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to add number of circulators in series, such as suggested by Upton, to the system of Scott in order to enable transmission of signal from one port to another and provide much better isolation so the co-channel interference decreases with circulators, thus provide more efficient and increased performance which increased data output (see Abstract and summary).

Upton, further, teaches that waveform 206 may be transmitted as either an optical or an RF waveform (column 10, lines 50-51).

Art Unit: 2419

It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute an RF output, such as that suggested by Upton, to the backhaul cable of Scott in order to route a high frequency signal between a radio transmitter and antennas.

### ***Response to Arguments***

4. Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues the "Examiner fails to articulate reasoning with sufficient specificity to support a legal conclusion of obviousness." Examiner respectfully disagrees. The examiner still contends that a more efficient and increased performance are legitimate and convincing reasons for someone in the art to use circulator. Also, "the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Leapfrog Enter, Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) (quoting *KSR*, 127 S. Ct. at 1739). "One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims." *KSR*, 127 S. Ct, at 1742.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SABA TSEGAYE whose telephone number is (571)272-3091. The examiner can normally be reached on Monday-Friday (7:30-5:00), First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pankaj Kumar can be reached on (571) 272-3011. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2419

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Saba Tsegaye  
Examiner  
Art Unit 2419

/S. T./  
Examiner, Art Unit 2419

/Hong Cho/  
Primary Examiner, Art Unit 2419